Technical Reference Manual for U.S. Coast Survey T-Sheet No. 1432b (1876)

Provenance, Survey Methodology, and Evidentiary Limits

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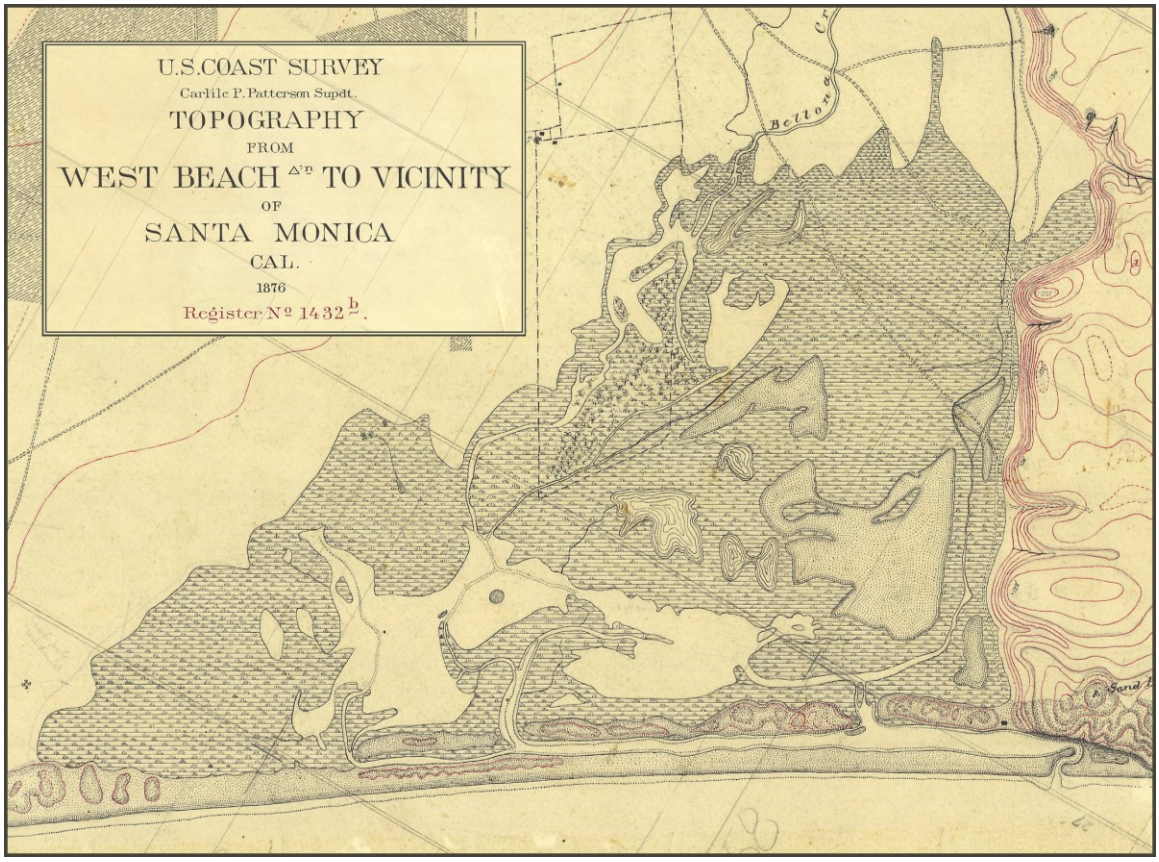
Prepared under the Triple-AI Recursive Consensus Review (TARC) methodology



1. Executive Summary

U.S. Coast Survey T-Sheet No. 1432b (1876) bears the sheet title "Topography from West Beach [triangulation symbol] to Vicinity of Santa Monica, Cal." It is a topographic survey of the Ballona Wetlands surveyed by Assistant Alexander W. Chase. It is one of the principal pre-development cartographic records of the Ballona coastal wetlands and is routinely cited as a historical baseline in restoration planning and regulatory review.

This manual consolidates four Internet Archive publications derived from two underlying technical reports (referred to here as Document A and Document B), together with primary-source correspondence from the National Geodetic Survey (NGS/NOAA) obtained in 2021 and 2026. It resolves a citation error present in both prior reports — which conflated two separate NGS communications, three years apart, as a single January 2026 exchange — and adds two categories of information absent from the prior reports entirely: named survey control marks (§ 8), and a primary 1865 Coast Survey field-procedure source that predates the secondary methodology reference (Shalowitz, 1964) both prior reports relied upon exclusively (§ 4).

Four questions concerning field conditions during the 1876 survey — the specific date, tidal stage, antecedent rainfall, and eastern-marsh freshwater status — remain unanswered in the documentary record. This is attributable to Coast Survey documentation practice of the era: descriptive reports, which might have recorded this information had one been produced, were not required until April 11, 1887, eleven years after T-1432b was completed. This manual treats that absence as a defined evidentiary limit rather than an unresolved research problem, and separates what the survey documents reliably (spatial configuration, feature location, control geometry) from what it cannot document (point-in-time environmental conditions).

The manual's technical assessment of survey control (§ 8) is substantively new relative to the two prior reports, incorporating control-mark identification and resolution work completed after January 2026 under the Triple-AI Recursive Consensus Review (TARC) methodology, including three full TARC forward-pass review rounds (AI-1 Perplexity Computer, AI-2 ChatGPT) plus a dedicated final-edition hardening pass. T-1432b's scale is confirmed at 1:20,000, correcting the 1:10,000 figure both prior reports used throughout (§ 3.1, § 8.2). See the Revision History for the full list of changes.

A note on scope. This manual is the first volume in a technical reference series on T-1432b. It answers *what T-1432b is*: its provenance, survey methodology, documented content, evidentiary limits, and historical context. A companion volume, *Geometric Uncertainty in U.S. Coast Survey T-Sheet T1432b (1876)*, answers a distinct question — *how reliably can T-1432b be registered to a modern coordinate system* — and is not restated here except by cross-reference. See § 2.2.

Table of Contents

1. Executive Summary 2
2. Introduction and Purpose 3
3. Survey Provenance and Metadata 4
4. Coast Survey Methodology 5
5. What T-Sheet 1432b Documents 7
6. Field Conditions and Survey Limitations 8
7. Historical Context 10
8. Technical Assessment: Survey Control and Interpretive Limits 11
9. Later Scientific and Regulatory Interpretations 12
10. Common Misinterpretations 13
11. Conclusions 13
Appendix A: Data, Figures, and Control-Point Register 14
Appendix B: Technical Glossary 16
Appendix C: References 17
Supersession Note 18
Revision History 19

2. Introduction and Purpose

This manual addresses two distinct classes of question about T-1432b: (a) matters of survey provenance, methodology, and survey-control evidence, which are answerable from the documentary and correspondence record; and (b) matters of field conditions at the moment of survey — date, tide, rainfall, and localized hydrology — which are not answerable from any presently known source and are treated here as bounded unknowns rather than open research questions requiring further speculation.

The manual is organized as a standing technical reference rather than as a chronological research narrative. Each chapter is intended to stand on its own for citation purposes. Observations (what the survey depicts, what correspondence states) are distinguished throughout from interpretation (what those depictions or statements imply), and uncertainty is stated explicitly rather than resolved by inference where the record does not support resolution.

Editorial Principle. This manual distinguishes among three categories throughout: (1) direct historical evidence — what a primary source states or a sheet depicts; (2) historically supported interpretation — a reading of that evidence that this manual states as such, distinguished from the evidence itself; and (3) questions that remain undocumented within the presently identified record. These categories are intentionally not merged. Where the historical record is silent, that silence is preserved rather than replaced by inference. This is why some questions in this manual are answered with "unknown," "undocumented," or "not established from sources identified and reviewed to date" rather than with a plausible-sounding account — those are deliberately distinct findings, not interchangeable hedges, and

the specific term used in each case is chosen to match precisely what the record does and does not support.

2.1 Scope

This manual covers: survey provenance and metadata; Coast Survey field methodology as applicable to marsh environments; the features T-1432b documents; the four unresolved field-condition questions and their documentary basis; the historical context in which the survey was produced and later used; survey-control evidence and limits on positional interpretation, including named control marks; common misinterpretations of the survey's evidentiary scope; and a consolidated reference apparatus (glossary, control-point register, bibliography).

This manual does not extend to the broader Ballona hydrological, botanical, or partition-history research corpus except by cross-reference. Readers seeking that material should consult the related technical reports cited in Appendix C.

2.2 Relationship to Companion Reports

This Reference Manual documents the provenance, survey methods, field procedures, metadata, historical context, symbols, and appropriate interpretation of T-1432b. It deliberately does not address modern geodetic registration, positional uncertainty, datum succession, or the transcription and interpretive status of the later hand-drawn annotations found on the surviving sheet. Those matters are treated in a dedicated companion report and are out of scope here except where necessary to state an interpretive limit (see § 8).

Geometric Uncertainty in U.S. Coast Survey T-Sheet T1432b (1876) (companion report) addresses the separate question of how reliably T-1432b can be registered to a modern coordinate system — datum succession (NAD27/NAD83), the five later geodetic reference annotations found on the sheet, possible non-rigid sheet deformation, and georectification method and residuals. This Reference Manual assumes no familiarity with that report's technical content. As of this manual's completion, the companion report's most recent draft still carries substantial standalone background on T-1432b's provenance and documentation status, predating this manual's existence; that background is superseded by this manual and should not be relied upon where the two documents differ.

Future companion reports addressing other specialized topics in this research program (e.g., historical hydrology, botanical notations, partition history) are cited where relevant in Appendix C but are not summarized here.

3. Survey Provenance and Metadata

3.1 Confirmed Metadata

- Official designation: T-1432b (Register No. 1432b)
- Full title on sheet: "Topography from West Beach [triangulation symbol] to Vicinity of Santa Monica, Cal." The bracketed description of the symbol is this manual's interpretation of the mark following "West Beach," not literal title-block text; see § 8.1 for what NOAA correspondence indicates about the symbol convention.
- Survey year: 1876

- Surveyor: Alexander W. Chase, Assistant, U.S. Coast Survey
- Scale: **1:20,000**, confirmed by direct examination of the original title block ("Scale 1/20,000"). See § 8.2 for the correction history and its implications.
- Method: Chain survey (Gunter's chain) with plane-table mapping
- Superintendent of record on title block: Carlile P. Patterson
- Geographic coverage: West Beach triangulation station to the vicinity of Santa Monica, California, encompassing the Ballona Lagoon complex
- A period-hand label, "North West Base," appears beside a triangle-type symbol near the top of the title-block area, of unconfirmed function. This manual does not confirm the label's function against Coast Survey records and treats it as an observed label of unconfirmed function. It is recorded in Appendix A on that basis and does not appear in the companion Geometric Uncertainty report's station discussion. See § 8.4.

These items are corroborated across both prior source reports and the T-sheet's own title block and are treated as established fact rather than inference.

3.2 Surveyor: Alexander W. Chase

Chase served as an Assistant with the U.S. Coast Survey during the 1860s–1870s, conducting triangulation and topographic work along the Pacific coast, including contemporaneous California surveys T-1427 (Santa Monica vicinity, 1876) and T-1432a (Point Dume to Santa Monica, circa 1876).[1] Independent of his survey career, Chase is separately documented as an early investigator of coastal shell-midden archaeology in northern California and southern Oregon (1869–1874), which is noted here only as biographical context and carries no bearing on the technical reliability of T-1432b.

4. Coast Survey Methodology

4.1 Institutional Context

The U.S. Coast Survey was established in 1807 to survey and chart the U.S. coastline. "T-sheets" (topographic sheets) were the intermediate cartographic product from which nautical charts were compiled; they extended inland far enough to capture the full tidal zone and the transition between marine and terrestrial environments. T-1432b is one product of this systematic, congressionally mandated coastal mapping program, produced under the standard institutional and methodological framework of its era rather than as an isolated or exceptional undertaking.

4.2 Primary Field-Procedure Source

Both prior source reports (Documents A and B) cite Aaron L. Shalowitz's *Shore and Sea Boundaries* (1964) as their sole methodological authority for how marsh terrain was surveyed. Shalowitz is a valuable secondary/interpretive source — compiled 88 years after T-1432b — but it is not the primary

[1]This manual uses "U.S. Coast Survey" for the agency's 1876-era work and "U.S. Coast and Geodetic Survey" only for work after its 1878 renaming (Grossinger et al. 2011), including the 1887 Westdahl resurvey (§ 7). "National Geodetic Survey (NGS), National Ocean Service (NOS), NOAA" refers to the agency's present-day form, used for Douglas Graham's 2021/2026 correspondence throughout this manual.

field-procedure document contemporaneous with Chase's work. In direct correspondence (July 29, 2026), Douglas Graham of the NGS Remote Sensing Division identified the applicable primary source as:

> *"THE PLANE-TABLE AND ITS USE IN TOPOGRAPHICAL SURVEYING (FROM THE COAST SURVEY REPORT FOR 1865.)"*

This 1865 Coast Survey report predates T-1432b by eleven years and describes the field procedure and instrumentation (plane table, alidade, chain) in use at the time Chase would have trained and worked. Subsequent investigation identified it as a holograph manuscript treatise by **A.M. Harrison (Alexander Medina Harrison, 1829–1881)**, digitized by the Internet Archive.[2] This manual treats it as the primary methodological citation, with Shalowitz (1964) retained as a secondary source for later interpretive and legal-boundary context, particularly the surveyor-variability discussion in § 4.4 below.

4.3 Chain Survey Procedure

The standard measurement tool was Gunter's chain: 66 feet in length, 100 links, each link 7.92 inches. Coast Survey policy, as excerpted by Shalowitz from period instructions, specified:

> *"The survey must always be conducted with the chain, and the 'Method of intersections,' and sketching by the eye the contours of shore lines, marshes, etc. must never be resorted to except where it is not possible to get along with the chain, or where a large extent of straight sandy or marshy sea coast exists, and then the points fixed by intersections should not exceed 400 metres when the scale of the survey is 1/10000."*

Applied to Ballona's marsh terrain, this means direct chain measurement was the required default; sketching by eye was permitted only where chaining was physically impossible, or along uniform stretches of coast. The Shalowitz-excerpted policy quoted above bounds intersection-fixed points to no more than 400 meters apart specifically "when the scale of the survey is 1/10000." T-1432b's confirmed scale is 1:20,000, not 1:10,000 (§ 3.1); whether the same 400-meter bound applied at T-1432b's actual scale is not established by the source reviewed here and is flagged as an open question (§ 8.4). Where field conditions permitted, plane-table parties of this era commonly relied on direct chain and angular observations, plotted onto the plane table in the field; no source specific to T-1432b documents its crews' particular channel-crossing method, and none is asserted here.

4.4 Surveyor Variability

Graham's correspondence (April 20, 2021) forwards a specific historical caution from Shalowitz regarding an earlier surveyor, Mr. Renard (1837, Register No. T-13), whose delineation practice was described by contemporaries as unusually free even by the loose standards of the era. Shalowitz notes this pattern persisted into later decades:

[2] Internet Archive identifier `planetable1865100harr`. The manuscript volume also contains, bound in afterward, an abridged printed excerpt dated 1867 — cataloged by the holding institution as "apparently a proof copy for a reprint" of the treatise published as Appendix No. 22 in the *Report of the Superintendent of the Coast Survey* (1865, No. 30) — along with 1853 Coast Survey projection tables, Benjamin Smith Lyman's "Telescopic Measurement in Surveying," and handwritten triangulation tables. This manual cites the 1865 holograph as the primary methodological source and the 1867 excerpt as the closest citable published form; both should be treated as the same underlying work, not two independent sources. See Appendix C for the full catalog citation.

> *"...ofttimes adjoining topographic surveys by different topographers exhibit differences in representation in the common area, particularly along a marshy shore. An example of this is found at the junction of Register No. T-1471b (1879) and Register No. T-1482b (1878)."*

T-1471b and T-1482b are contemporaneous with T-1432b (within one to three years) and are a historically cited example of surveyor-to-surveyor variability in marsh-boundary delineation during this period; this manual has not independently verified the cited sheet pair or the Shalowitz passage's page reference against a primary copy, and states the citation with that caveat rather than as independently confirmed. This manual does not perform a quantitative comparison of their overlap zone and takes no position on what such a comparison would show (§ 8.4).

4.5 Quality Implications for T-1432b

This manual distinguishes two separate kinds of confidence, which §§ 4.2–4.4 bear on differently and which should not be conflated. **Historical descriptive confidence** — how well the sheet documents the historical presence, relative arrangement, and general configuration of major features — is high for major channels, the primary lagoon extent, and features depicted in relation to named original-period marks, and moderate for marsh-to-upland vegetation boundaries, reflecting both the surveyor-discretion pattern documented by Shalowitz and the inherent gradualness of marsh transitions. **Modern coordinate confidence** — the sheet's absolute placement and local positional precision in a present-day coordinate system — is a separate question this manual does not assess; it is the subject of the companion Geometric Uncertainty report (§ 2.2).

No quantitative error bound for T-1432b specifically has been established. The commonly cited ±10–20 meter figure in Documents A and B is a period-practice inference, not a measurement of T-1432b itself, and is flagged in § 10 as a common misinterpretation risk. A related, properly sourced figure exists in the literature but measures something different and should not be substituted for it: Grossinger et al. (2011) georeferenced their T-sheet series primarily via NAD 1927 latitude/longitude graticule tick marks, then *tested* that method's accuracy, for a sample of T-sheets, by measuring the offset between persistent physical features on the georeferenced sheets and 2005 aerial photography — finding an average error of 19.28 m, describing results generally as "within 20 m" and in some cases "within 10–15 m," while cautioning that such T-sheets "should not be assumed to have a potential error of less than 50 m." This is a method-level error bound tested across a sample of the atlas's 26 sheets, not a measurement of T-1432b specifically, and this manual has not confirmed whether T-1432b was among the sheets sampled for that test.

5. What T-Sheet 1432b Documents

5.1 Mapped Features

- Ballona Lagoon complex, including Ballona Lake (open-water feature)
- Channel network connecting the lagoon to Santa Monica Bay*
- Vegetated wetland, tidal flat, and salt-flat zones
- Springs and seeps in the eastern marsh area
- Ballona Creek and Centinela Creek channels and confluence
- Beach, dune, and barrier formations along Santa Monica Bay

- Sparse roads, trails, and property/land-grant boundary lines

*This manual uses the neutral term "channel network" rather than "tidal channel network," consistent with evidentiary discipline established elsewhere in this research program: Hancock's 1858 Rancho La Ballona field notes, recorded under sworn survey commission, describe the inner bay's connection with the sea as "often obstructed" rather than reliably tidal. Whether, and to what degree, the mapped channels functioned as a tidal system at the time of the 1876 survey is a separate historical-hydrology question addressed in other reports in this research program, not resolved by T-1432b itself.

A note on vegetation terminology. The category labels above ("vegetated wetland," "tidal flat," "salt flat") are not verbatim transcriptions from the 1876 sheet; this manual has not independently confirmed the exact original sheet labels for these zones. They follow the interpretive classification system Grossinger et al. (2011) applied uniformly across their 26-sheet T-sheet atlas (their Table 2, Level I/II categories). Grossinger et al. classify T-1432b's mapped Ballona wetland (711 ha total) as 70% vegetated wetland, 16% tidal flat, 8% salt flat, and 3% open-water ponds, with Ballona Creek and a smaller tributary entering from the east, and describe a single tidal source at the northwestern edge of the bluffs. These are the atlas's interpretive categories and characterizations, attributed to Grossinger et al. throughout, and do not independently resolve tidal connectivity or condition during the undocumented 1876 field period (§ 6); they are not a finding of this manual and should not be read as one. Readers requiring the original 1876 sheet's own symbology and any handwritten labels should consult the sheet directly or the companion Botanical Notations report.

5.2 What It Does Not Document

T-1432b is a topographic product. It does not record water chemistry, salinity, temperature, or any laboratory or field-instrument water-quality measurement; 1876 Coast Survey topographic practice did not include such sampling and Chase carried no equipment for it. Vegetation type is recorded by visual field classification only, without reference to a modern botanical key. The sheet also carries no explicit date, tidal stage, or weather annotation — the subject of § 6.

6. Field Conditions and Survey Limitations

This chapter addresses four questions raised directly with NGS in the original 2021 inquiry that led to this line of research: the survey date, the tidal stage during observation, cumulative antecedent rainfall, and the freshwater status of the eastern marsh. Each is stated as a direct answer, followed by its documentary basis. Where a source is silent, this manual states that silence directly rather than filling it with inference (§ 6.6).

6.1 Survey Date, Month, and Season

Direct answer: unknown and undocumented. No Descriptive Report was produced for T-1432b; NGS has confirmed this directly (§ 6.5). Any personal field notes Chase may have kept were not official records and have not been located in the archival record reviewed for Documents A and B.

6.2 Tidal Stage During Survey

Direct answer: undocumented. No field tide-stage notation has been located for T-1432b specifically. NOAA/NGS correspondence supports the absence of a T-1432b Descriptive Report (§ 6.5), the document class that would ordinarily have captured this information; it does not by itself establish a universal

negative for all Coast Survey field practice before 1887. Tidal datums of the era were established regionally for chart purposes, not necessarily per topographic survey observation.

6.3 Cumulative Rainfall Prior to Survey

Direct answer: not determined from the official records located and reviewed to date. Downtown Los Angeles precipitation records begin July 1, 1877 — after T-1432b was surveyed. The nearest regional data point, from Ventura (approximately 60 miles northwest), recorded roughly 21 inches for the 1876 water year with an anomalous October 1875 peak, but this station is too distant to be treated as a proxy for site conditions.

Documentary note: NARA Record Group 27 (Records of the Weather Bureau, 1735–1979) contains Army post-surgeon weather diaries and other observational material with pre-1876 coverage, as well as a rainfall-station report series specifically documented for 1887–88 — after, not during, T-1432b's survey. This manual does not assert that 1876-specific rainfall reports have been located within RG 27, nor does it undertake that search; it states only that documented candidate series exist (Army-post observations, meteorological summaries, and station-arranged historical compilations) without characterizing their 1876 coverage one way or the other. Direct inquiry to NARA (§ 6.6), including the prior technical reports as research context, did not surface additional 1876-specific rainfall records beyond the general RG 27 holdings described above. RG 27 is retained here strictly as a residual lead for localized 1876 weather reconstruction — not as a lead expected to resolve T-1432b's survey provenance or control, which no additional framework documentation was identified for through the documented inquiries described in § 6.6.

6.4 Eastern Marsh Freshwater Status

Direct answer: undocumented. No source reviewed for this manual establishes the freshwater or salinity condition of the eastern marsh at the time of the 1876 survey. Springs and seeps are mapped as features (§ 5.1) but their flow state, seasonality, and salinity are not recorded.

6.5 Why No Descriptive Report Exists

Douglas Graham, NGS Remote Sensing Division, confirmed directly (April 20, 2021; reconfirmed July 29, 2026) that no Descriptive Report exists for T-1432b, and that Descriptive Reports — the document class that might have recorded survey dates, tidal stage, weather, and environmental notes had one been produced — were first produced experimentally in 1863 but were not institutionally required until April 11, 1887:

> *"Unfortunately a Descriptive Report was not written for T-T01432B (1876). The first Descriptive Report was in 1863 but was not required until April 11, 1887." — Douglas Graham, NGS/NOS/NOAA, correspondence with T. McMahon*

This absence therefore reflects standard institutional practice eleven years before the requirement took effect, not a records-preservation failure specific to this survey. This manual adopts that framing throughout rather than treating the four questions above as an archival mystery. The absence of supporting documentation is not based solely on an incomplete project search: § 6.6 documents targeted inquiries with NOAA/NGS, USGS, and the National Archives, informed by the prior T-1432b reports, which did not identify a Descriptive Report, field book, station description, triangulation record, survey metadata, or equivalent documentation sufficient to reconstruct the 1876 survey framework.

This does not exclude the possibility that an as-yet undiscovered record exists; it establishes that the search was not casual.

6.6 Direct Agency Inquiry

The author of this manual directly contacted personnel at the National Oceanic and Atmospheric Administration (NOAA), the U.S. Geological Survey (USGS), and the National Archives and Records Administration (NARA), providing each with copies of the prior technical reports on T-1432b (Documents A and B) as research context. None of these agencies identified additional records bearing on the four field-condition questions addressed in this chapter, beyond what is already cited in this manual. These were direct research inquiries, not the kind of dated, quotable correspondence recorded elsewhere in this manual (§ 4.2, § 6.5, § 8.1); they establish that the absences described in this chapter reflect an actively searched record, not an unsearched one. The one remaining unexploited lead identified anywhere in this manual is narrow: localized 1876 weather reconstruction via NARA Record Group 27 (§ 6.3). No additional documentation bearing on the T-1432b survey framework itself was identified through the documented inquiries described here; consistent with § 6.5, this does not exclude the possibility that an as-yet undiscovered record exists.

7. Historical Context

T-1432b was produced during a narrow historical window: after Spanish- and Mexican-era rancho land use and early Euro-American settlement of the Ballona area, and well before the large-scale agricultural conversion, harbor construction, and urban development that transformed the watershed over the following century. This timing is what gives the survey its baseline value — and also what limits it, since a single-era spatial snapshot cannot by itself establish the range of conditions (wet-year/dry-year, seasonal, tidal) the pre-development wetland actually experienced.

A separate, documented 1887 resurvey by U.S. Coast and Geodetic Survey Assistant Ferdinand Westdahl recorded later channel-mouth conditions following harbor-development dredging at Ballona and may be relevant to future cross-epoch comparison; see Grossinger et al. (2011, p. 20) and the companion Geometric Uncertainty report (§ 2.2) for further detail, which is not restated here.

Subsequent land-use change in the watershed is well documented elsewhere in this research program, including Ballona Creek channelization, Marina del Rey construction, and Los Angeles International Airport expansion. This manual does not restate that history in full; readers should consult the Ballona Creek Terminus Report and related hydrological memoranda cited in Appendix C for the fuller historical-baseline treatment, including the pre-1876 primary sources (Hancock 1857–58, Courtney 1867–68) against which any quantitative habitat-loss figure should be checked before citation.

Document B states a specific habitat-loss figure (approximately 14,149 acres of original wetland extent versus 577 acres of the current Ballona Wetlands Ecological Reserve, a 96% loss). This manual does not restate that figure as a valid loss calculation: 14,149 acres is a watershed-wide historical-wetland estimate, while 577 acres is the Ballona Wetlands Ecological Reserve's footprint — the two figures describe different geographic extents (watershed-wide versus reserve-footprint) and should not be subtracted or compared as a percentage loss without first reconciling their extents. See the historical-baseline sources cited above for the fuller reconciliation.

8. Technical Assessment: Survey Control and Interpretive Limits

Neither prior source report (Document A or B) addresses geodetic control resolution beyond general, non-quantified statements about survey-era accuracy. This chapter is substantively new material, drawing on NGS correspondence and control-mark identification work completed after the two prior reports were archived. Per § 2.2, this chapter states only what is needed to establish appropriate interpretive limits for this manual; the full geometric-registration analysis is the companion report's subject, not this manual's.

8.1 Named Control Stations

Direct examination of the surviving T-1432b sheet identifies **three original-period named triangle-and-circle marks, interpreted as survey-control stations**: **High Table, Ridge, and La Mesa**, each marked in the sheet's original period hand. "High Table" corresponds, in name and physiographic position, to the ridge Hancock's independent 1858 Rancho La Ballona survey labels "High rolling" / "Table Land" — an independent cross-check between two separate nineteenth-century surveys of the same ground. Formal station descriptions and NGS recovery records for these three marks have not been located (§ 8.4); this manual's identification rests on direct visual examination of the sheet, not on independent geodetic confirmation.

West Beach appears in the sheet title (§ 3.1) beside the symbol this manual describes as a triangulation symbol. Its precise location and formal relationship to High Table, Ridge, and La Mesa are not independently established in this manual. NOAA/NGS correspondence (Douglas Graham, July 29, 2026) cited "High Table," "Ridge," and "West Beach" together as examples of triangle-symbol survey control stations on Coast Survey sheets of this kind; that correspondence should be read as illustrating the *symbol convention*, not as asserting that West Beach is one of this sheet's three named marks. This manual's prior revision (v0.11) stated the three-station set as West Beach, High Table, and Ridge; that was an incorrect reading of the correspondence and is corrected as of this revision. See Appendix A for the full control-point register and the Revision History for this correction.

8.2 Scale and Resolution

T-1432b's scale is **1:20,000**, confirmed by direct examination of a title-block crop from the original NOAA scan ("Scale 1/20,000"), independently corroborated by Grossinger et al. (2011, p. 20). The 1:10,000 figure used throughout Documents A and B, and carried forward into earlier drafts of this manual, was incorrect.

T-1432b is larger-scale than a standard 1:24,000 USGS 7.5-minute quadrangle — this comparison concerns map scale only, not demonstrated positional accuracy or completeness of feature depiction, which are addressed separately in § 4.5 and the companion Geometric Uncertainty report. Because T-1432b's scale is now confirmed to be double the map denominator both prior reports assumed, any feature-size or distance inference drawn from those reports using a 1:10,000 assumption should be treated as unreliable pending re-derivation at the correct scale. This applies in particular to the Shalowitz-derived 400-meter intersection-point spacing discussed in § 4.3, which was specified for 1:10,000-scale work and has not been confirmed to apply unchanged at 1:20,000.

Grossinger et al. describe T-1432b's 1:20,000 scale as anomalous relative to the rest of the regional survey series but do not, in the excerpt reviewed for this manual, offer a documented explanation for why Chase's survey departed from the standard 1:10,000. That remains an open question (§ 8.4).

8.3 Later Geodetic Reference Annotations

The surviving T-1432b sheet also carries **five later hand-drawn annotations**, distinct in hand, ink, and content from the 1876 engraved survey and from the three original-period marks identified in § 8.1. Each cites a reference to the "North American Datum" (in most cases qualified "(1927)") together with an angular or coordinate value. These annotations postdate the original 1876 survey; their precise function — later registration control, station-recovery notation, or a graticule reference mark used in a later georeferencing effort — has not been independently confirmed. Per § 2.2, the full transcription, dating, and interpretive analysis of these five annotations is the subject of the companion Geometric Uncertainty report and is not restated here.

8.4 Stated Limits of This Assessment

This manual states the following as permanent, final limits of what the reviewed record supports — not as an active research agenda for a future revision of this manual. Readers requiring resolution of these points should consult primary Coast Survey and NGS records directly, or the companion Geometric Uncertainty report where noted; this manual will not be updated to reflect any future resolution.

- **"North West Base" (§ 3.1):** a period-hand label beside a triangle symbol on the title-block area of the sheet, provisionally interpreted as a baseline station distinct in role from High Table, Ridge, and La Mesa. This manual confirms the label's presence on the sheet by direct visual examination; it does not confirm the label's function against Coast Survey records, and states that function as unresolved rather than asserting a specific role.
- Whether the Shalowitz-derived 400-meter intersection-point spacing (§ 4.3), specified for 1:10,000-scale work, applied unchanged to T-1432b at its confirmed 1:20,000 scale is not established by any source reviewed for this manual, and this manual takes no position on it.
- Why Chase's survey was executed at 1:20,000 rather than the 1:10,000 standard used for most contemporaneous Southern California T-sheets (per Grossinger et al. 2011) is not documented in any source reviewed for this manual and is stated here as an unexplained fact of the historical record, not a gap in this manual's research.
- T-1471b and T-1482b are cited (§ 4.4) as a historically referenced example of surveyor-to-surveyor variability; this manual does not perform a quantitative comparison of their overlap zone and takes no position on the magnitude of variability it would show.
- The three named survey control stations (High Table, Ridge, La Mesa) are confirmed by direct visual examination of the surviving sheet only; this manual does not independently confirm them against National Geodetic Survey station-recovery records and makes no claim about what such records would show.
- Function and dating of the five later geodetic reference annotations (§ 8.3) are addressed, to the extent they are addressed at all, in the companion Geometric Uncertainty report; this manual takes no position on them beyond noting their existence and category.

9. Later Scientific and Regulatory Interpretations

Not addressed in this manual. T-1432b's use in subsequent scientific and regulatory contexts — including its citation as historical baseline in Ballona Wetlands restoration and regulatory documents, or its interaction with other flood-capacity or baseline determinations established elsewhere in this research program — requires a separate administrative and technical source record and is outside this publication's scope.

10. Common Misinterpretations

This section catalogs interpretive errors distinguishable from the documentary unknowns and stated limits described in §§ 6 and 8.

10.1 Treating the Survey as a Dated Environmental Snapshot

Because T-1432b carries no date, tide, weather, or salinity annotation, any claim that it documents a specific environmental condition on a specific day should be treated as unsupported. The survey documents spatial configuration reliably; it does not document a point-in-time environmental state.

10.2 Treating the ±10–20 Meter Accuracy Figure as Measured

As noted in § 4.5, this commonly repeated figure is a period-practice inference carried forward from Documents A and B, not a measurement specific to T-1432b. See § 4.5 for the properly sourced alternative figure (Grossinger et al. 2011) and why it also should not be cited as a T-1432b-specific measurement.

10.3 Treating Absence of a Descriptive Report as a Records Loss

As established in § 6.5, the absence reflects the survey predating the 1887 Descriptive Report requirement by eleven years. It is not evidence that records were created and later lost.

10.4 Citing the Shalowitz (1964) Excerpt as the Primary Field-Procedure Source

As established in § 4.2, the applicable primary source is the 1865 Coast Survey report on plane-table procedure. Shalowitz (1964) is an important secondary and legal-interpretive source but should not be cited as the contemporaneous methodology authority.

10.5 Conflating Original Survey Control With Later Geodetic Annotations

The three original-period named marks interpreted as survey-control stations (High Table, Ridge, La Mesa; § 8.1) and the five later hand-drawn geodetic reference annotations (§ 8.3) are categorically different classes of mark on the sheet, distinguishable by symbol type (open triangle-and-circle in period hand, versus hatched triangles or a cross in later ink or pencil), and separated by decades. Citing an annotation's coordinate value as if it were part of the original 1876 survey record, or citing one of these named marks as if it carried a modern coordinate value, both misstate what the sheet documents. This manual and its companion report maintain this terminology distinction throughout and it should be preserved in any derivative citation.

11. Conclusions

T-1432b is strong evidence of the historical presence, relative arrangement, and general spatial configuration of the Ballona wetland complex as it existed at some undocumented point in 1876, produced under standard Coast Survey methodology of its era and showing named original-period survey-control marks (High Table, Ridge, and La Mesa; § 8.1). Its absolute modern coordinate placement and local positional precision are a separate question this manual does not resolve; they remain subject to the limitations addressed in the companion Geometric Uncertainty report. T-1432b is also not, and

cannot be made into, a dated environmental record: the survey date, tidal stage, antecedent rainfall, and eastern-marsh salinity state have not been established from sources identified and reviewed to date — for rainfall, subject only to the narrow residual weather-record lead described in § 6.3 — and this absence is fully explained by documentation standards that predate the survey by eleven years rather than by any deficiency in the survey itself. This is not an unsearched gap: § 6.6 documents direct inquiry to NOAA, USGS, and NARA personnel, using the prior technical reports as research context, which did not surface additional records.

For restoration and regulatory purposes, T-1432b should be cited for what it reliably establishes — historical spatial extent, channel configuration, feature location relative to named original-period marks, and general habitat-type distribution — and should not be cited, directly or by inference, for point-in-time environmental claims it cannot support, or for modern positional-accuracy claims this manual does not make. Where a specific claim requires environmental dating (season, tide, salinity) or engineering-scale modern positioning, the appropriate response is to state that the record does not support the claim, not to supply the missing value by inference.

T-1432b's scale is confirmed at 1:20,000 (§ 3.1, § 8.2); this is not an open question. Several other points — the function of the "North West Base" label, whether the Shalowitz-derived 400-meter intersection-point bound applied at T-1432b's confirmed scale, why Chase surveyed at 1:20,000 rather than the regional 1:10,000 standard, and independent NGS station-recovery confirmation of the three named control stations — are not resolved by any source reviewed for this manual. § 8.4 states each of these as a permanent limit of this assessment rather than as an item awaiting a future revision of this manual; readers requiring further resolution should consult primary Coast Survey and NGS records directly. This manual is intended to document the historical survey record faithfully rather than to maximize the range of conclusions that may be drawn from it — which is why so many of the questions above are answered with "unknown" or "not established" rather than with inference.

Appendix A: Data, Figures, and Control-Point Register

This register consolidates all named survey control marks referenced in this manual, with source and verification status. It supersedes the scattered treatment of this information across Documents A and B, neither of which maintained a consolidated register. Per § 2.2, the five later geodetic reference annotations are noted here only by count and category; their full transcription and analysis is maintained exclusively in the companion Geometric Uncertainty report.

Observed Label	Visible Symbol	Category (observed)	Confidence	Source	Function / Status
High Table	Open triangle-and-circle, period hand	Original 1876 survey control	Confirmed	Direct visual examination; corresponds to Hancock 1858 "High rolling"/"Table Land"	Presence on sheet confirmed. NGS station-recovery record cross-check not performed; this manual does not assert one.

Observed Label	Visible Symbol	Category (observed)	Confidence	Source	Function / Status
Ridge	Open triangle-and-circle, period hand	Original 1876 survey control	Confirmed	Direct visual examination	Presence on sheet confirmed. NGS station-recovery record cross-check not performed; this manual does not assert one.
La Mesa	Open triangle-and-circle, period hand	Original 1876 survey control	Confirmed	Direct visual examination	Presence on sheet confirmed. NGS station-recovery record cross-check not performed; this manual does not assert one.
West Beach	(per title block; symbol not separately confirmed in this review)	Sheet's titled origin/reference station	Confirmed (title designation only)	T-1432b title block	Named in the sheet title. Its symbol, precise location, and formal relationship to the three named marks above have not been independently established in this manual.
North West Base	Triangle, period cursive hand	Possible baseline	Provisional	Title-block-area crop, direct visual examination	Label and symbol confirmed present; baseline function is this manual's interpretation only, not independently confirmed against Coast Survey records. Not present in the companion Geometric Uncertainty report's station discussion.
Five later geodetic reference annotations (not itemized here)	Hatched triangles (4) and a cross (1), later ink/pencil	Later annotation set, distinct from original survey control	Companion report only	Companion Geometric Uncertainty report, § 6, Table 1	Categorically distinct from the named original-period marks above (§ 10.5). Full transcription, dating, and interpretation maintained exclusively in the companion report; not restated or re-verified here.

Figures: a title-block crop from the project-held native NOAA scan of T-1432b was examined directly for this manual and verifies the sheet's scale ("1/20,000"), surveyor ("A.W. Chase, Assistant"), superintendent ("Carlile P. Patterson, Supdt."), survey year (1876), register number ("1432b"), and full title wording, all referenced throughout this manual by description rather than reproduced as an embedded image in this edition. Any separate rights record for an Internet Archive derivative of the scan has not been confirmed and is not relied upon here.

Appendix B: Technical Glossary

- **Chain Survey** — Direct linear-measurement method using Gunter's chain (66 feet, 100 links, 7.92 inches per link). See § 4.3 for the period policy governing its use and the scale-specific qualification this manual applies to it.
- **Descriptive Report** — A narrative document accompanying a survey that could record field dates, methods, and field-condition observations. First produced experimentally in 1863; mandatory from April 11, 1887.
- **Survey Control Station** — This manual's preferred umbrella term for a precisely positioned reference point (shown as an open triangle-and-circle symbol on the T-sheet, in period hand) from which subsequent measurements are anchored. Distinct from later geodetic reference annotations (see below). For T-1432b specifically, this manual has confirmed the presence and period-hand labeling of such symbols by direct visual examination; it has not independently reconstructed their modern coordinates, formal station descriptions, or positional precision — see § 8.4.
- **Triangulation Station** — The period-specific term used on the T-1432b title block itself, following "West Beach." This manual uses "survey control station" as a general descriptive term elsewhere and reserves "triangulation station" for direct reference to the sheet's own title wording; the precise correspondence between all observed symbol forms on the sheet and their underlying station functions has not been independently confirmed by this manual.
- **Later Geodetic Reference Annotation** — A hand-drawn mark added to a T-sheet after its original survey, referencing a modern geodetic datum (e.g., "North American (1927) Datum") together with a coordinate or angular value. Distinguishable from original survey control by symbol type, ink/medium, and hand. Not part of the original survey record. See § 8.3 and § 10.5.
- **Gunter's Chain** — Standard 66-foot, 100-link surveying chain (7.92 inches per link), invented by Edmund Gunter (1620), used for direct distance measurement.
- **Plane Table** — Portable tripod-mounted drafting board used with an alidade to plot survey measurements graphically in the field.
- **T-Sheet (Topographic Sheet)** — Intermediate manuscript map product of the U.S. Coast Survey, source material for nautical chart compilation.

Appendix C: References

Primary Sources

- Graham, Douglas. Personal communication (email). Remote Sensing Division, National Geodetic Survey (NGS), National Ocean Service (NOS), NOAA. April 19–20, 2021.
- Graham, Douglas. Personal communication (email). Remote Sensing Division, National Geodetic Survey (NGS), National Ocean Service (NOS), NOAA. July 29, 2026.
- U.S. Coast Survey. (1876). Topographic Sheet T-1432b, "Topography from West Beach [triangulation symbol] to Vicinity of Santa Monica, Cal." Surveyed by Alexander W. Chase, Assistant; Carlile P. Patterson, Superintendent. Scale per title block: 1:20,000, confirmed by direct examination of a title-block crop (`Original_T1432b_scan_Title_Block.jpg`) from a full-resolution NOAA-sourced scan held by the author (§ 3.1, § 8.2). This manual does not

hold a formal NOAA repository accession or catalog number for the source scan; readers requiring one should contact NOAA's National Geodetic Survey or Office of Coast Survey directly.

- Harrison, A. M. (Alexander Medina Harrison, 1829–1881). *The Plane-Table and Its Use in Topographical Surveying.* Holograph manuscript, 1865, with bound-in printed excerpts including an abridged reprint dated 1867, cataloged as "apparently a proof copy for a reprint" of the treatise published as Appendix No. 22, *Report of the Superintendent of the Coast Survey* (1865, No. 30). Digitized manuscript, Internet Archive: https://archive.org/details/planetable1865100harr (identified via T. McMahon–Douglas Graham correspondence, NGS/NOAA, Jul. 29, 2026; link verified).
- *Field Notes of the Final Survey of the Rancho La Ballona*, Agustin Machado et al., Confirmee. Henry Hancock, Deputy Surveyor. Survey commenced July 14, 1858; completed July 19, 1858. County Surveyor Volume G5, pages 298–314. Certified as a true transcript by Theo. Wagner, U.S. Surveyor-General for California, San Francisco, February 17, 1882. Cited for the "High Table" / "High rolling" / "Table Land" correspondence (§ 8.1) and the "often obstructed" characterization of the inner bay's connection with the sea (§ 5.1).

Secondary and Interpretive Sources

- Shalowitz, Aaron L. (1964). *Shore and Sea Boundaries, with Special Reference to the Interpretation and Use of Coast and Geodetic Survey Data*, Vol. 2, Part 2, Ch. 4: "Analysis and Interpretation of Topographic Surveys." U.S. Coast and Geodetic Survey Publication 10-1. U.S. Government Printing Office.
- Grossinger, R.M., E.D. Stein, K.N. Cayce, R.A. Askevold, S. Dark, and A.A. Whipple. (2011). *Historical Wetlands of the Southern California Coast: An Atlas of US Coast Survey T-sheets, 1851–1889.* San Francisco Estuary Institute Contribution #586 / Southern California Coastal Water Research Project Technical Report #589. Full text: https://www.sfei.org/sites/default/files/biblio_files/So_Cal_T-sheet_Atlas_lowres.pdf (link verified). T-1432b discussed at pp. 20–23, including its habitat-type breakdown (§ 5.1), confirmed 1:20,000 scale (§ 3.1, § 8.2), and the 1887 Westdahl resurvey (§ 7). The 19.28 m average / 50 m practical lower-bound error figures (§ 4.5) are reported at p. 4, from testing the atlas's graticule-based registration method against persistent physical features on a sample of the atlas's 26 T-sheets — not measured for T-1432b specifically.

Superseded Prior Reports (this manual's source documents)

- "T-Sheet No. 1432b: Survey Field Conditions and Historical Context — A Comprehensive Analysis of Metadata Availability for the 1876 Ballona Wetlands Coastal Survey" ["Document A"]. Internet Archive, archived Jan. 30–31, 2026 (two copies).
- "T-Sheet No. 1432b: Comprehensive Analysis of a Historical Coastal Survey of the Ballona Wetlands — Final Enhanced Edition" ["Document B"]. Internet Archive, archived Jan. 30–31, 2026 (two copies).

Related Research (this program, cited but not restated here)

- Ballona Creek Terminus Report, v5.72 (published Mar. 1, 2026, Internet Archive). Project-held companion report in this research program; cited for the fuller historical-baseline and land-use-change treatment referenced in § 7, not independently reproduced here.
- Geometric Uncertainty in U.S. Coast Survey T-Sheet T1432b (1876) (companion report; see § 2.2). Source of the five-annotation transcription, datum-succession analysis, and georectification discussion referenced in § 8.3.
- Botanical Notations in the 1858 Hancock and 1868 Hansen Rancho Surveys. Project-held companion report in this research program; cited for the "High Table" / "High rolling" / "Table Land" correspondence (§ 8.1), not independently reproduced here.

Supersession Note

This document is the canonical technical reference for U.S. Coast Survey T-Sheet No. 1432b (1876). It supersedes the four items listed below, previously deposited to the Internet Archive in January 2026. Those items should be considered superseded drafts; this manual consolidates, corrects, and extends their content.

Link status: attempts to independently verify these four identifiers via web search during TARC review did not resolve them (a likely retrieval limitation for low-traffic personal-account uploads rather than evidence the items are missing or wrong). Each should be opened directly in a browser to confirm it resolves to the stated title, archive date, and content before this manual is treated as final.

Item	Title	Archived	Identifier
Document A copy 1	"T Sheet No. 1432b Ballona Wetlands Coastal Survey Metadata Field Conditions and Historical Context"	Jan. 31, 2026	https://archive.org/details/t-sheet-no.-1432b-ballona-wetlands-coastal-survey-metadata-field-conditions-and-historical-context
Document A copy 2	"T-Sheet 1432b Comprehensive Report, Claude 02.md, Map"	Jan. 30, 2026	https://archive.org/details/t-1432b-comprehensive-report-claude-02.md-map
Document B copy 1	"T Sheet No. 1432b Survey of the Ballona Wetlands, Methadology, Historical Context, Field Conditions Analysis"	Jan. 31, 2026	https://archive.org/details/t-sheet-no.-1432b-survey-of-the-ballona-wetlands-methadology-historical-context-
Document B copy 2	"T-Sheet No. 1432b: Comprehensive Analysis of a Historical Coastal Survey of the Ballona Wetlands" (Final Enhanced Edition)	Jan. 30, 2026	https://archive.org/details/t-sheet-1432b-final-perplexity-01.md-map

Note: the paired items within each row ("copy 1" and "copy 2") were deposited as duplicate archival copies of the same underlying report versions, archived under different titles and dates. This duplication is documented rather than resolved by silent deletion, consistent with the principle that period record variance is preserved rather than erased.

Revision History

Rev.	Date	Description	Status
v0.1	August 8, 2026	Initial draft. Synthesizes Document A ("T-Sheet No. 1432b: Survey Field Conditions and Historical Context," archived Jan. 29–31, 2026) and Document B ("T-Sheet No. 1432b: Comprehensive Analysis of a Historical Coastal Survey of the Ballona Wetlands," Final Enhanced Edition, archived Jan. 29–31, 2026), reconciled against NOAA/NGS correspondence with Douglas Graham (Apr. 2021; Jul. 2026). Supersedes the four Internet Archive items listed in § Supersession Note.	Superseded by v0.11
v0.11	August 8, 2026	Added full bibliographic identification of the § 4.2 primary methodology source: author A. M. Harrison (1829–1881), holograph manuscript vs. 1867 abridged printed reprint distinguished, Internet Archive digitized-manuscript citation added (Appendix C). Per T. McMahon–Douglas Graham correspondence, NGS/NOAA, Jul. 29, 2026 (10:26 PM email).	Superseded by v0.2
v0.2	August 8, 2026	First TARC forward-pass round adjudicated (AI-1 Perplexity Computer, AI-2 ChatGPT). Added § 2.2 "Relationship to Companion Reports," formalizing the two-volume architecture (this manual vs. the companion Geometric Uncertainty report). Corrected § 8.1 / Appendix A control-station list from {West Beach, High Table, Ridge} to {High Table, Ridge, La Mesa}, based on primary-text confirmation from the companion Geometric Uncertainty report (v3.25), which resolves West Beach as the sheet's titled origin station rather than one of the three interior control marks. Added § 8.3 summarizing the five later geodetic reference annotations by count and category only, per the companion-report scope boundary; full annotation transcription remains exclusive to the companion report. Flagged an unresolved 1:10,000 (title block) vs. 1:20,000 (Grossinger et al. 2011) scale conflict (§ 3.1, § 8.2, § 8.4) pending direct verification. Sharpened § 4.5 / § 10.2 treatment of the ±10–20 m accuracy figure, distinguishing Grossinger et al.'s (2011) 19.28 m / 50 m method-level error bound from any measured property of T-1432b itself. Changed § 5.1 "Tidal channel network" to "Channel network," consistent with corpus-wide "tidal" terminology discipline (Hancock 1858, "often obstructed"). Added a one-line mention of the 1887 Westdahl resurvey to § 7. Added § 10.5, "Conflating Original Survey Control With Later Geodetic Annotations." Added Grossinger et al. (2011) full citation to Appendix C.	Superseded by v0.21

Rev.	Date	Description	Status
v0.21	August 8, 2026	Resolved the § 8.2 scale conflict by direct examination of a title-block crop from the original NOAA scan: **T-1432b's confirmed scale is 1:20,000**, not 1:10,000, confirming Grossinger et al. (2011) and correcting the figure carried forward from Documents A and B. Updated § 3.1, § 8.2, § 8.4, Conclusions, and Appendix C accordingly. Flagged that the Shalowitz-derived 400-meter intersection-point spacing (§ 4.3), specified for 1:10,000-scale work, has not been confirmed to apply unchanged at T-1432b's actual 1:20,000 scale. Identified a new station, "North West Base," visible in period hand on the title-block-area crop, distinct in geodetic role (baseline vs. triangulation station) from High Table, Ridge, and La Mesa; not present in the companion Geometric Uncertainty report's station discussion; added to Appendix A as an uncharacterized open item.	Superseded by v0.3

v0.3	August 8, 2026	Second TARC forward-pass round adjudicated (AI-1 Perplexity Computer, 22 findings; AI-2 ChatGPT, 12 comments). Renamed § 8 from "Positional and Geometric Accuracy" to "Survey Control and Interpretive Limits" to resolve a scope-boundary conflict with § 2.2. Softened "North West Base" from an asserted baseline classification to a provisional, sheet-label-only observation (§ 3.1, § 8.1, § 8.4, Appendix A). Restructured Appendix A into a flat table with an explicit observed-category column, replacing the "interior control stations" / "four stations" language that implied undemonstrated hierarchy. Separated **historical descriptive confidence** from **modern coordinate confidence** as an explicit distinction in § 4.5 and Conclusions, per the companion report's own framing. Corrected the § 4.5 / Appendix C description of Grossinger et al.'s (2011) 19.28 m error figure: it is a method-level test result (persistent physical features vs. 2005 aerial photography, sampled across the atlas's 26 sheets), not derived from graticule tick marks directly and not measured for T-1432b specifically. Retrieved and cited Grossinger et al. (2011) directly (stable SFEI URL, Appendix C) rather than via the companion report; used it to correct § 5.1's vegetation-zone terminology, clarifying that "vegetated wetland / tidal flat / salt flat" are Grossinger et al.'s interpretive classification categories (with T-1432b's confirmed 70%/16%/8%/3% breakdown), not verbatim 1876 sheet labels. Fixed a citation-certainty overstatement in § 4.2 / Appendix C regarding the Harrison manuscript's 1867 reprint status (Internet Archive catalog: "apparently a proof copy," not a confirmed publication), moving supporting detail to a footnote. Corrected § 6.3's NARA RG 27 characterization, which had conflated a 1774–1876-era holdings description with a rainfall-report series specifically documented for 1887–88 — an error flagged in the first TARC round (AI-1 finding F006) that was not carried through to v0.2/v0.21 and is now fixed. Narrowed § 6.2's universal claim about Coast Survey tide-gauge practice to T-1432b-specific scope. Softened § 4.4's "only documented, citable benchmark" claim regarding T-1471b/T-1482b. Removed an unsupported T-1432b-specific claim about boat-crossing field procedure in § 4.3. Replaced the § 7 habitat-loss editorial note with a permanent footnoted caution identifying the 14,149-acre and 577-acre figures as non-comparable geographic extents (watershed-wide vs. reserve-footprint), with better-matched comparator figures noted. Trimmed the § 7 Westdahl resurvey discussion to one sentence per scope discipline. Removed all placeholder content from § 9 per direct instruction (no source material available); replaced with a one-line reserved-for-future-edition note, retaining the chapter's numbering slot. Fixed an institutional-naming inconsistency in § 3.2 (Chase's 1860s–1870s work was under the U.S. Coast Survey, not yet renamed U.S. Coast and Geodetic Survey until 1878; footnoted an editorial naming rule for the rest of the manual). Corrected the Appendix A figure-source note to distinguish the controlling NOAA source scan from any separately-rights-status	Superseded by v0.4

Rev.	Date	Description	Status
		Internet Archive derivative. Added a qualifying note to the Appendix B triangulation-station glossary entry. Converted the four Supersession Note identifiers to full clickable links; independent verification of these four items was attempted but did not resolve via web search (likely a low-traffic personal-account retrieval limitation, not a confirmed defect) and remains outstanding. Trimmed repeated full restatement of the scale-correction narrative across the Executive Summary, § 3.1, § 4.3, § 8.2, § 10.2, and Conclusions to a single detailed location (§ 8.2) with brief cross-references elsewhere.	

v0.4	August 8, 2026	**Final-edition hardening pass**, per author's direction that this is the last Internet Archive publication on T-1432b with no anticipated corrigenda. Third TARC round adjudicated (AI-2 ChatGPT; AI-1 Perplexity Computer, 20 findings). Added § 6.6, "Direct Agency Inquiry," documenting the author's direct contact with NOAA, USGS, and NARA personnel (prior reports supplied as research context; no additional T-1432b documentation identified); cross-referenced from § 6.3 and § 6.5 and used to establish that the survey-framework search is treated as exhausted, with NARA RG 27 retained only as a narrow residual lead for localized 1876 weather reconstruction, not survey provenance. Removed the two labeled "low-confidence inference" paragraphs from §§ 6.1–6.2 (survey-season timing; tidal-logistics timing) as an unnecessary residual risk for a final edition, per direct instruction. Removed unverified comparator habitat-loss figures (CDFW ~2,000-acre; TMDL ~1,762-acre) from the § 7 footnote pending independent verification that will not occur. Corrected an internal contradiction between § 3.1 (stated North West Base was not in the control-point register) and Appendix A (which already listed it) — resolved by fixing § 3.1 to match Appendix A's existing, correct treatment. Fixed a self-contradictory candidate function ("original registration control") for the five later annotations in § 8.3, corrected to "later registration control," since the annotations postdate the 1876 survey by definition. Softened first-use language for the three named control stations in § 8.1 and the Conclusions ("showing named original-period survey-control marks" rather than "anchored to named survey control"), reflecting that formal NGS station-recovery records for High Table, Ridge, and La Mesa remain unlocated. Corrected an unverified comparative superlative ("most detailed pre-development cartographic record") to "one of the principal pre-development cartographic records," and tightened the Executive Summary's description of the survey to follow the sheet's own title wording rather than implying a documented operational field sequence. Replaced counterfactual "would have captured" language (Executive Summary, § 6.5) with "might have recorded... had one been produced." Rewrote § 9 to state plainly that later scientific/regulatory interpretation is out of scope, removing residual "future revision" framing inconsistent with a final, no-corrigenda edition. Clarified the Appendix A West Beach row and strengthened the Appendix A figure note to state directly what the title-block crop verifies (scale, surveyor, superintendent, year, register, title), rather than describing it only vaguely. Simplified the Appendix B "Chain Survey" glossary entry to a neutral definition, moving period-policy specifics exclusively to § 4.3; removed the unused "Mean Lower Low Water (MLLW)" glossary entry, which appeared nowhere else in the manual and risked implying chart datum establishes T-1432b's field tidal stage. Strengthened the Appendix C primary-source citation for the T-sheet itself with the project scan filename and full title-block wording, while stating plainly that no formal NOAA repository	Superseded by v0.41

Rev.	Date	Description	Status
		accession number is held. Softened the Supersession Note's unverified "substantively identical text" claim to "duplicate archival copies," since no diff or checksum comparison exists. Removed companion-report draft version numbers (v3.25) from live body text (§ 2.2, Appendix C) to prevent this manual from reading as tied to a specific companion-report draft that will advance independently. Changed "planned two-volume technical reference" to "first volume in a technical reference series" for the same reason. Established "survey control station" as the preferred umbrella term in Appendix B, reserving "triangulation station" for direct quotation of the sheet's own title. Added a Confidence column to Appendix A. Tightened the Executive Summary's description of the manual's source-report consolidation and added a closing methodological statement to the Conclusions. **One item remains outstanding and is not resolved by this revision:** the four Supersession Note Internet Archive identifiers have not been independently verified by any party in this TARC process (automated retrieval attempts failed); direct browser verification by the author is the single remaining gate before this edition can be considered fully closed.	
v0.41	August 8, 2026	Retitled per colleague suggestion: "T-Sheet No. 1432b Reference Manual / Provenance, Methodology, and Historical Context of the 1876 U.S. Coast Survey of the Ballona Wetlands" → "Technical Reference Manual for U.S. Coast Survey T-Sheet No. 1432b (1876) / Provenance, Methodology, and Evidentiary Limits." The new subtitle better reflects the manual's actual emphasis — bounding what the record does and does not support — rather than "Historical Context," which described only § 7. No content changes.	Superseded by v0.42
v0.42	August 8, 2026	Third-round title convergence from both TARC reviewers. Refined subtitle "Provenance, Methodology, and Evidentiary Limits" → "Provenance, Survey Methodology, and Evidentiary Limits" (AI-2 ChatGPT: "methodology" alone read as abstract; "Survey Methodology" specifies Coast Survey field practice). Added a short-form title ("T1432b Technical Reference Manual") for running headers and cross-references, and a suggested-citation line, both per AI-1 Perplexity Computer. Declined two other reviewer suggestions on the merits: a four-term subtitle adding "Documentation" (redundant with "Evidentiary Limits," which already covers that theme via §§ 6, 6.5, 6.6, 8.4), and "Documentary Evidence"/"Evidentiary Interpretation" in place of "Evidentiary Limits" (the manual's distinctive contribution is bounding what the evidence supports, not merely presenting it). Held explicit "Volume 1"/"Volume 2" series labeling and the three-line stacked cover format as open questions for the author rather than applying unilaterally, since the companion Geometric Uncertainty report is not part of this manual's no-corrigenda commitment and its title has not been coordinated.	Superseded by v0.43

Rev.	Date	Description	Status
v0.43	August 8, 2026	**Backward continuity-check pass** (author-directed technique: reading the document from Revision History back to the title to catch what forward reading misses), performed after many rounds of piecemeal targeted edits. Verified all footnote markers match definitions (clean) and all § cross-references resolve to real, current section numbers (clean). Found and fixed four genuine continuity breaks left over from earlier rounds: (1) § 6's opening sentence still promised "a clearly labeled low-confidence inference" for each field-condition question, though both inference paragraphs were removed from §§ 6.1–6.2 in the v0.4 hardening pass — reworded to match what the chapter actually delivers. (2) § 8.1's discussion of West Beach still used "three interior control stations" (twice), the exact phrasing Perplexity's round-2 F004 flagged and that was fixed in Appendix A and § 8.1's own first-use sentence, but never in this specific passage — aligned to current terminology. (3) § 5.1's mapped-features bullet list ("unvegetated (tidal/salt) flat") did not match its own explanatory note's category breakdown (which treats tidal flat and salt flat as two separate Grossinger et al. categories at 16% and 8%) — bullet and note both corrected to list "tidal flat" and "salt flat" separately and consistently. (4) The Executive Summary's TARC-round count ("two full TARC forward-pass review rounds") was written at v0.3 and never updated after the v0.4 hardening pass constituted a third full round — corrected to "three full TARC forward-pass review rounds... plus a dedicated final-edition hardening pass." Also corrected the front-matter suggested-citation line, which would otherwise have cited a stale revision number on every subsequent version — a self-undermining error for a document whose central discipline is precision. **One item remains outstanding and is not resolved by this revision:** the four Supersession Note Internet Archive identifiers still require direct author browser verification.	Superseded by v0.44

v0.44	August 8, 2026	Fourth-round bidirectional TARC review adjudicated (AI-1 Perplexity Computer, 14 findings), applying a stated editorial rule: use the same level of certainty at the end of the document as at its introduction of evidence. Standardized the title-block transcription ("Topography from West Beach [triangulation symbol] to Vicinity of Santa Monica, Cal.") identically across the Executive Summary, § 3.1, and Appendix C, separating literal title-block text from this manual's interpretation of the symbol. Replaced ambiguous "technical accuracy" in § 2's scope statement with "survey provenance, methodology, and survey-control evidence," matching § 2.2's boundary precisely. Removed an unsupported taxonomy comparison for "North West Base" (§ 3.1), which had implicitly defined an "ordinary survey control station" class the manual doesn't establish; the provisional baseline interpretation remains, properly hedged, in § 8.4 and Appendix A only. Softened "control-mark-anchored features" (§ 4.5) and "control-anchored feature location" (Conclusions) to "features depicted in relation to named original-period marks," removing residual absolute-location implications. Fixed a scope leak in § 5.1's vegetation note, where Grossinger et al.'s "single tidal source" characterization could be read as this manual's own finding; now explicitly and repeatedly attributed to Grossinger et al. and disclaimed as not resolving 1876 tidal connectivity. Sharpened § 6.3's direct answer from "cannot be determined from official records" to "not determined from the official records located and reviewed to date," acknowledging the retained RG 27 residual lead. Bounded "exhausted" language in § 6.3 and § 6.6 to the documented agency inquiries specifically, restoring § 6.5's existing caveat that an as-yet undiscovered record cannot be excluded — this had drifted toward reading as an absolute impossibility claim. Fixed § 10's opening sentence, which mischaracterized § 6 as containing "open research questions" when it presents documentary unknowns and one narrow residual lead. Aligned § 10.5's terminology ("three original-period named marks interpreted as survey-control stations") with § 8.1's already-cautious first-use phrasing, which § 10.5 had reverted away from. Softened the Conclusions' categorical "not recoverable from any source presently identified" to "not established from sources identified and reviewed to date," with the same rainfall-specific carve-out as § 6.3. Fixed the Appendix B "Descriptive Report" glossary entry, which restored counterfactual certainty ("recording field dates...") that the body deliberately removed in the v0.4 hardening pass ("might have recorded... had one been produced"). Fixed the Appendix B "Triangulation Station" entry's unsupported claim that all observed triangle-type symbols on the sheet are the same class as the title block's; removed the stale "West Beach Triangulation Station" quote inconsistent with the corrected title-block transcription. Added a full primary-source citation for Hancock's 1858 Rancho La Ballona field notes to Appendix C (previously cited substantively in §§ 5.1, 7, and 8.1 without a complete bibliographic entry); labeled the Ballona Creek	Superseded by v0.45

Rev.	Date	Description	Status
		Terminus Report and Botanical Notations report as project-held companion reports not independently reproduced here, rather than leaving them under-cited. **Deferred to the author as a procedural release-gate item, not editable in advance of verification:** the reviewer's recommendation to replace the Supersession Note's "automated retrieval failed" language with a clean verified statement — appropriate only after the author performs the still-outstanding direct browser check of the four predecessor links.	
v0.45	August 8, 2026	Fourth-round bidirectional TARC review adjudicated (AI-2 ChatGPT), confirming no continuity failures and endorsing the manual's preservation of period-specific technical terminology (triangulation station, Descriptive Report, plane table, Gunter's chain, etc.) rather than modernized substitutes — consistent with this manual's practice throughout. Added an explicit "Editorial Principle" paragraph to § 2, stating outright the three-category evidentiary discipline (direct evidence / historically supported interpretation / undocumented questions) that had previously been implicit in the manual's practice rather than stated as a named doctrine. Noted but did not act on a vaguer stylistic observation (occasional "advisory" tone drift in later chapters) — a full scan found the flagged "should" constructions to be methodological cross-references, not the softer drift described, and the reviewer did not identify a specific passage requiring correction; introducing speculative tone edits this late in a heavily fact-hardened document was judged higher-risk than the marginal, subjectively-perceived benefit. Both AI reviewers have now independently recommended against further general review passes, limiting further work to targeted verification of specific facts or citations. **One item remains outstanding:** the four Supersession Note Internet Archive identifiers still require direct author browser verification — the sole remaining gate before this edition is fully closed.	Superseded by v0.46
v0.46	August 8, 2026	Removed the short-form title and suggested-citation lines from the front matter (added at v0.42 per reviewer suggestion), per direct author instruction — did not read as useful front matter for this document. No other changes.	Superseded by v0.47

Rev.	Date	Description	Status
v0.47	August 8, 2026	Fifth-round targeted final check adjudicated (AI-1 Perplexity Computer, 2 findings), following ChatGPT's confirmation of title-block facts, footnote structure, dates, and section cross-references. Fixed a punctuation error in the Executive Summary's title-block quotation (redundant comma after the closing quote, alongside the period already inside it, both following the abbreviation "Cal."); restructured the sentence to close the quotation cleanly. Fixed § 8.1's West Beach paragraph, which still asserted West Beach as the sheet's "titled triangulation station of origin" — a claim § 3.1's precise transcription no longer supports, since "[triangulation symbol]" is explicitly this manual's interpretation of the mark, not confirmed title-block text; reworded to state only what is established (West Beach appears in the title beside the symbol) without asserting a station function or "origin" role. Confirmed Appendix A's existing West Beach row does not share this problem — its "origin/reference station" label describes the title's geographic framing, not a confirmed symbol function, and its Function/Status column already carries the correct hedge. **One item remains outstanding:** the four Supersession Note Internet Archive identifiers still require direct author browser verification — the sole remaining gate before this edition is fully closed.	Final candidate, pending author verification of Supersession Note links